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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/769,408	01/26/2001	Yoshihito Asao	Q62613	4699

7590 09/20/2002
SUGHRUE, MION, ZINN, MACPEAK & SEAS
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037

EXAMINER

NGUYEN, HANH N

ART UNIT	PAPER NUMBER
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2834

DATE MAILED: 09/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/769,408

Applicant(s)

ASAO ET AL.

Examiner

Nguyen N Hanh

Art Unit

2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 July 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26/1/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) Z.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Remarks

In view of amendment, The Examiner withdraws the objections to the drawings and the abstract.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1,2,4,5,11,12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al. and further in view of Hiroshi (EPA 0 671 801)

Regarding claim 1, the applicant's admitted prior art discloses an automotive alternator comprising: a rotor fastened to a shaft rotatably supported by a front bracket (1 in Fig. 25) and a rear bracket (3), said rotor having a pair of Lundell-type pole cores disposed inside said brackets; a stator (8) supported by said brackets, said stator being disposed so as to cover an outer circumference of said rotor, a pulley (4) fastened to a front end of said shaft; and a rectifier (12) disposed at a rear end of said rotor, wherein a plurality of front-end and rear-end air intake apertures (1a and 2a) are disposed in axial end surfaces of said front and rear brackets, respectively; a plurality of front-end and rear-end air discharge apertures (1b and 2b) are disposed in radial side surfaces of said front and rear brackets, respectively; and front-end and rear-end blowing means (5a

Art Unit: 2834

and 5b) are disposed at front and rear axial ends of said rotor, respectively, whereby a front-end ventilation pathway in which a cooling air flow flows through said front-end air intake apertures into said front end bracket and flows out through said front-end air discharge apertures, a rear-end ventilation pathway in which a cooling air flow flows through said rear-end air intake apertures into said rear-end bracket and flows out through said rear-end air discharge apertures, and a front-to-rear ventilation pathway in which a cooling air flow flows through an inner side of said rotor between said front end and said rear end each is generated by operation of said blowing means (see arrows in Fig. 25).

The applicant's admitted prior art fails to show the blowing means wherein a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate and a stator comprising: a cylindrical stator core in which a plurality of slots having grooves lying in an axial direction are disposed circumferentially so as to open onto an inner circumferential side; and a stator coil installed in said stator core so as to constitute a predetermined winding construction

However, Umeda et al. shows a stator cooling arrangement comprising: a cylindrical stator core (32 in Fig. 2) in which a plurality of slots having grooves (the portion surround insulator 34 in Fig. 4) lying in an axial direction are disposed circumferentially so as to open onto an inner circumferential side; and a stator coil installed in said stator core so as to constitute a predetermined winding construction for the purpose of improving cooling.

Moreover, Hiroshi et al. disclose an alternator for vehicle with the blowing means wherein a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means (fan blades 8' at rear-end has a greater size than the size of fan blade 8 at front-end as shown in Fig. 1), and a front-end air intake flow rate is greater than a rear-end air intake flow rate (because the distance from the air intake aperture is so long that the resistance to the air flow is large, the flow rate becomes small) for the purpose of improving cooling.

Since the applicant's admitted prior art, Umeda et al. and Hiroshi are in the same field of endeavor, the purpose disclosed by Umeda et al. and Hiroshi would have been recognized in the pertinent art of the applicant's admitted prior art.

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify applicant's admitted prior art and form an alternator with the blowing means wherein a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate; and modify applicant's admitted prior art and form a stator comprising: a cylindrical stator core in which a plurality of slots having grooves lying in an axial direction are disposed circumferentially so as to open onto an inner circumferential side; a stator coil installed in said stator core so as to constitute a predetermined winding construction as taught by Umeda et al. and Hiroshi for the purpose of improving cooling.

Art Unit: 2834

Regarding claim 2 and 14, Hiroshi also shows the automotive alternator wherein a front-end air discharge flow rate is greater than a rear-end air discharge flow rate (inherent when front-end intake flow rate is greater than front-end discharge flow rate)

Regarding claim 4, Hiroshi also shows the automotive alternator wherein said front-end and rear-end blowing means are fans.

Regarding claim 5, Hiroshi also shows the automotive alternator wherein: said front-end blowing means is one of said Lundell-type pole cores; and said rear-end blowing means is a fan (Fig. 3).

Regarding claim 11 Umeda et al. also show the automotive alternator wherein said stator coil is constructed by: inserting coil segments composed of short conductors (33 in Fig. 2) formed into a general U shape from a first end of said stator core into slot pairs (Col. 3 line 41) in which said slots in each pair are a predetermined number of slots apart (Fig. 2); and circumferentially bending and joining together free end portions of said coil segments extending outwards at a second end of said stator core from slots the predetermined number of slots apart so as to constitute the predetermined winding construction (Col. 3, lines 46-47), wherein turn-end coil ends formed by U-shaped turn ends of said coil segments are aligned in rows circumferentially to constitute a turn-end coil end group, and joint-end coil ends formed by said joining of said free end portions of said coil segments are aligned in rows circumferentially to constitute a joint-end coil end group (Fig. 2 and 3).

Regarding claim 12, Umeda et al. also show the automotive alternator wherein said joint-end coil end group of said stator coil is disposed at said front end of said stator core (Fig. 5)

2. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al. and Hiroshi and further in view of Kato et al.

Regarding claim 13, the automotive alternator disclosed by the applicant's admitted prior art modified by Umeda et al. and Hiroshi shows all the limitations of the claimed invention but fails to show the automotive alternator wherein said stator coil is constructed by linking a plurality of winding sub-portions so as to constitute the predetermined winding construction, wherein each of said winding sub-portions is constituted by one strand of wire constituted by a large number of straight portions housed inside said slots and a large number of turn portions linking together end portions adjacent straight portions outside said slots, said strand of wire being installed in said stator core by housing said straight portions so as to form different layers relative to a slot depth direction in slots the predetermined number of slots apart, and coil ends formed by said turn portions are aligned in rows circumferentially to constitute front-end and rear-end coil end groups of said stator coil.

However, Kato et al. disclose an alternator wherein said stator coil is constructed by linking a plurality of winding sub-portions so as to constitute the predetermined winding construction, wherein each of said winding sub-portions is constituted by one strand of wire (Fig. 18) constituted by a large number of straight portions (2011-2016)

Art Unit: 2834

housed inside said slots and a large number of turn portions (2211-2216) linking together end portions adjacent straight portions outside said slots, said strand of wire being installed in said stator core by housing said straight portions so as to form different layers relative to a slot depth direction in slots the predetermined number of slots apart (Fig. 5), and coil ends formed by said turn portions are aligned in rows circumferentially to constitute front-end and rear-end coil end groups of said stator coil for the purpose of improving winding structure.

Since the applicant's admitted prior art, Umeda et al., Hiroshi and Kato et al. are in the same field of endeavor, the purpose disclosed by Kato et al. would have been recognized in the pertinent art of the applicant's admitted prior art, Umeda et al. and Hiroshi

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify the prior art and make a stator wherein said stator coil is constructed by linking a plurality of winding sub-portions so as to constitute the predetermined winding construction, wherein each of said winding sub-portions is constituted by one strand of wire constituted by a large number of straight portions housed inside said slots and a large number of turn portions linking together end portions adjacent straight portions outside said slots, said strand of wire being installed in said stator core by housing said straight portions so as to form different layers relative to a slot depth direction in slots the predetermined number of slots apart, and coil ends formed by said turn portions are aligned in rows circumferentially to constitute front-end

and rear-end coil end groups of said stator coil as taught by Kato et al. for the purpose of improving winding structure.

3. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al. and Hiroshi and further in view of Yoshioka (Patent number 5,977,668).

Regarding claim 3, the automotive alternator disclosed by the applicant's admitted prior art modified by Umeda et al. and Hiroshi shows all the limitations of the claimed invention but fails to show the front to rear ventilation pathway is block.

However, Yoshikoka discloses an alternator wherein the front to rear ventilation pathway is blocked by the ring (133 in Fig. 1 and Fig. 3) for the purpose of improving cooling.

Since the applicant's admitted prior art, Umeda et al., Hiroshi and Yoshioka are in the same field of endeavor, the purpose disclosed by Yoshioka would have been recognized in the pertinent art of the applicant's admitted prior art, Umeda et al. and Hiroshi.

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify the prior art and form an alternator wherein the front to rear ventilation pathway is blocked as taught by Yoshikoka for the purpose of improving cooling.

4. Claims 6-8 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al. and Hiroshi and further in view of Tanaka et al.

Art Unit: 2834

Regarding claims 6 and 15, the automotive alternator disclosed by the applicant's admitted prior art modified by Umeda et al. and Hiroshi shows all the limitations of the claimed invention but fails to show clearly the structure of the blowing means.

However, Tanaka et al. disclose an AC generator wherein said front-end (30 in Fig. 1) and rear-end blowing means (31 in Fig. 2) are fans, each fan comprising: a generally annular fan base portion; a plurality of blade base plates extending radially outwards from outer circumferential edge portions of said fan base portion; and a plurality of blades (30a and 31a) standing on an outer circumferential edge portion of each of said plurality of blade base plates for the purpose of circulating the cooling air.

Since the applicant's admitted prior art, Umeda et al., Hiroshi and Tanaka et al. are in the same field of endeavor, the purpose disclosed by Tanaka et al. would have been recognized in the pertinent art of the applicant's admitted prior art, Umeda et al. and Hiroshi

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify the prior art and form an alternator wherein said front-end and rear-end blowing means are fans, each fan comprising: a generally annular fan base portion; a plurality of blade base plates extending radially outwards from outer circumferential edge portions of said fan base portion; and a plurality of blades standing on an outer circumferential edge portion of each of said plurality of blade base plates as taught by Takana et al. for the purpose of circulating the cooling air.

Regarding claims 7 and 16, Tanaka et al. also show the automotive alternator wherein said rear-end fan (31) is provided with a greater number of blades (13 blades) than said front-end fan (11 blades)

Regarding claims 8 and 17, Hiroshi also shows the automotive alternator wherein a maximum blade height of said rear-end fan is greater than a maximum blade height of said front-end fan (Fig. 2).

5. Claims 9 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al., Hiroshi and Tanaka et al. and further in view of Ishida et al.

Regarding claim 9 and 18, the automotive alternator disclosed by the applicant's admitted prior art modified by Umeda et al., Hiroshi and Tanaka shows all the limitations of the claimed invention but fails to show the automotive alternator wherein said blade base plates of said rear-end fan are formed into a shape which blocks valley portions between adjacent magnetic poles of said rotor.

However, Ishida et al. disclose an electric machine wherein said blade base plates of said rear-end fan (7 in Fig. 2) are formed into a shape which blocks valley portions between adjacent magnetic poles of said rotor for the purpose of guiding the cooling air.

Since the applicant's admitted prior art, Umeda et al., Hiroshi, Tanaka et al. and Ishida et al. are in the same field of endeavor, the purpose disclosed by Ishida et al. would have been recognized in the pertinent art of the applicant's admitted prior art, Umeda et al., Hiroshi and Tanaka.

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify the prior art and form an alternator wherein said blade base plates of said rear-end fan are formed into a shape which blocks valley portions between adjacent magnetic poles of said rotor as taught by Ishida et al. for the purpose to guide the cooling air.

6. Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art in view of Umeda et al., Hiroshi and Tanaka et al. and further in view of Yoshioka.

Regarding claim 10, the automotive alternator disclosed by the applicant's admitted prior art modified by Umeda et al., Hiroshi and Tanaka shows all the limitations of the claimed invention but fails to show the automotive alternator wherein a shielding plate is disposed for blocking air gaps formed by said blade base plates of said rear-end fan and valley portions between adjacent magnetic poles of said rotor.

However, Yoshioka discloses an electric machine wherein a shielding plate (133 in Fig. 1) is disposed for blocking air gaps formed by said blade base plates of said rear-end fan and valley portions between adjacent magnetic poles of said rotor for the purpose to guide the cooling air.

Since the applicant's admitted prior art, Umeda et al., Hiroshi, Tanaka et al. and Yoshioka are in the same field of endeavor, the purpose disclosed by Yoshioka would have been recognized in the pertinent art of the applicant's admitted prior art, Umeda et al., Hiroshi and Tanaka.

It would have been obvious at the time of the invention was made to a person having an ordinary skill in the art to modify the prior art and form an alternator wherein said blade base plates of said rear-end fan are formed into a shape which blocks valley portions between adjacent magnetic poles of said rotor as taught by Yoshikoka for the purpose of guiding the cooling air

Response to Arguments

7. Applicant's arguments filed 7/2/02 have been fully considered but they are not persuasive. The applicant's argument is on the ground that the reference (Hiroshi) that The Examiner relies on does not teach "a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate" and it is not inherent when the front-end intake flow rate is greater than the front-end discharge flow rate (to create a front-end air discharge flow rate is greater than a rear end discharge flow rate). The Examiner respectfully disagrees with The Applicant. Increasing the blade size is one way to increase blowing capacity, the size of fan blade 8' clearly suggests the intention of Hiroshi to make the capacity of rear-end blowing means greater than the capacity of said front-end blowing means. By providing a greater number of blades might not be a best way to improve the blowing capacity, for example: it will not make much difference if we increase the number blade in small fan from 3 to 30 blades. The Applicant is invited to consider that the distance from rear air intake port to the blades in Fig. 1 of Hiroshi is so long that resistance to air flow becomes large, the air flow rate become small (Iwaki et al., Col. 3, lines 30-35), besides there are many air resistance objects

such as the brushes base and the heat sink. It is noted that there is virtually no difference between the structure of Fig. 1 of the present invention and the structure disclosed by Hiroshi (both have greater aperture size on the rear end, both have rear-end blowing means greater than front-end blowing means, both have long air way between rear aperture to fan blades, both have many resistance objects in the rear end, both have short and clear air way in the front end), if the embodiment of present invention has "a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate", it would make sense to assert that the structure of Hiroshi also has those features. Moreover, the present invention directed to an alternator wherein a rear-end fan is constructed so as "a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate" to suppress the noises, It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an automotive alternator wherein a capacity of said rear-end blowing means is greater than a capacity of said front-end blowing means, and a front-end air intake flow rate is greater than a rear-end air intake flow rate, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

When compare the structure of Fig. 1 of the present invention and the structure disclosed by Hiroshi, It is noted that both have an arrow showing a small portion of air flown from front-end to rear-end (a front-end flow rate is greater than a front-end

discharge flow rate), it suggests that air pressure on front side is greater on air pressure on rear side or front-end air discharge flow rate is greater than a rear-end discharge flow rate. Because that there is virtually no difference between the structure of Fig. 1 of the present invention and the structure disclosed by Hiroshi, if the structure of present invention has "a front-end air discharge flow rate is greater than a rear-end discharge flow rate", it would make sense to assert that the structure of Hiroshi also has that feature. Moreover, It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide an automotive alternator wherein a front-end air discharge flow rate is greater than a rear-end discharge flow rate, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

For the reasons discussed above, the rejection is still deemed proper.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2834

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information on How to Contact USPTO

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hanh N Nguyen whose telephone number is (703)305-3466. The examiner can normally be reached on Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703)308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-1782.



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HNN

September 17, 2002